Chapter 1:
Purpose and Need

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1.0 INTRODUCTION

An Environmental Assessment (EA) evaluates the effects of a proposed Federal action on the surrounding environment and is prepared in compliance with the National Environmental Policy Act (NEPA). Federal Aviation Administration (FAA) Order 1050.1E, *Environmental Impacts: Policies and Procedures,* and FAA Order 5050.4B, *Airport Environmental Handbook*, describe Federal airport and aviation actions that trigger the requirement for NEPA.

Ravalli County, Hamilton, Montana is proposing to acquire land, relocate and lengthen the existing Runway 16-34, and rehabilitate and construct taxiways, aprons, and hangar development areas at the Ravalli County Airport (RCA). This development proposal requires FAA approval of the Airport Layout Plan (ALP) and grant applications prior to consideration for Federal funding.

The improvements are expected to be completed within the next three to eight years, contingent upon funding. Four final alternatives for development resulted from the extensive analysis of the proposal; these alternatives are discussed in detail later in this document.

1.1 BACKGROUND AND EXISTING FACILITIES

RCA, serving the City of Hamilton and Ravalli County, has existed since the 1930's. RCA is located in western Montana, one (1) mile east of the City of Hamilton, and approximately fifty (50) miles south of the City of Missoula, Montana. Access to the Airport is provided from Missoula via State Highway 93 to Hamilton. The airport is situated in a valley with significant mountainous terrain to the south and west. The property immediately surrounding the airport is used for agricultural purposes with residential developments south of the airport. RCA's elevation is 3,644 feet Mean Sea Level (MSL) with the mean maximum temperature of the warmest month of 84°F. RCA has a total area of 318.87 acres, of which 307.59 acres are owned in fee by Ravalli County, and the remaining 11.28 acres are controlled by easement.

Current Airport facilities include a 4,200-foot x 75-foot asphalt runway (Runway 16-34), a 30-foot wide parallel taxiway, several connecting taxiways between Runway 16-34 and the parallel taxiway, a 225-foot x 655-foot asphalt apron, several taxilanes of various widths for hangar access, lighted wind sock and segmented circle, and rotating beacon. Runway 16-34 has a medium intensity runway edge lighting system with Precision Approach Path Indicators (PAPIs) as navigational aids on both ends. The design strength of asphalt pavement is 17,000 pounds single wheel loading.

In 2007, RCA had 29,400 estimated airplane operations and was home base for 119 aircraft. One operation is considered either a landing or a takeoff. The complete aviation forecasts and methodology are described in Appendix IV – *Forecasts of Aviation Activity*.

The airport is used for business, governmental, recreational, emergency medical, and personal use. Ravalli County is in the heart of the Bitterroot National Forest, and is heavily used for forest management purposes as well as for recreational purposes. During forest fire seasons, the airport is a vital link in fire control. In 2003, Nineteen (19) different helicopters flew on various missions from the airport along with many fixed-wing aircraft during the fire season. A temporary air traffic control tower was enacted and all non-essential flying was stopped during the worst of the fire season to accommodate aviation activity. Law enforcement agencies and forest product industries are also users of the airport as well.

1.2 PURPOSE AND NEED FOR THE PROPOSED DEVELOPMENT

1.2.1 Purpose of the Proposed Development:

Ravalli County's purpose is to improve RCA to meet FAA design standards for runway/taxiway separation and runway length for the type of aircraft forecast to use the airport during the next twenty years and to develop additional apron, taxiways, and hangar space to accommodate current and future growth.

The airport was initially designed for use by small aircraft with shorter wingspans than the type of aircraft using the airport today. The runway is located too close to the parallel taxiway and the runway length is too short to accommodate 100% of the small general aviation aircraft that currently use the airport.

Based on the airport design, and airport and airplane data, the RW length recommended to accommodate 100% of small general aviation (GA) aircraft is 5,200 feet. A small airplane is an airplane of 12,500 pounds or less maximum certificated takeoff weight, and includes A and B aircraft and some C aircraft, as defined below. Thus, Ravalli County is proposing to construct a 5,200 foot runway with a 400 foot separation from the parallel taxiway to accommodate 100% of the small GA aircraft, and to provide adequate space to develop additional aprons, taxiways, and hangars.

The Airport Reference Code (ARC) is a coding system used to relate airport design criteria to the operational and physical characteristics of the aircraft intended to operate at the airport. The design aircraft is the most demanding aircraft that has at least 500 or more annual operations at the airport (landings and takeoffs are considered separate operations) for an individual airplane or a family grouping of airplanes.

The critical design aircraft at RCA falls within the family of aircraft having an ARC of B-II, as discussed in Appendix IV, *Forecast of Aviation Activity*.

Generally, the FAA's design standards require greater separation between the runway and the taxiway as the approach speed and wingspan increases. To determine what design requirements apply, the ARC is used to enter the tables in FAA's Airport Design Advisory Circular (AC) 150/5300-13, which establishes design requirements. The ARC is based on two key factors: approach speed category (represented by a letter A, B, C, D, or E) and wingspan design group (represented by a number) for example, group I has wing spans less than 49 feet versus group II which goes from 49 feet, but less than 79 feet. Design group III aircraft have wingspans of 79 feet up to but not including 118 feet. When small aircraft (those aircraft weighing 12,500 pounds or less) exclusively use an airport, the runway to taxiway separation can be reduced to 150 feet. Since RCA serves aircraft weighing more than 12,500 pounds, the "exclusively small" design standard does not apply to the airport.

In 2007 there were an estimated 900 annual operations of B-II aircraft, which are expected to increase to 1,800 operations by 2030. Also, in 2007 there were an estimated 80 annual operations of C-I aircraft, which are expected to increase to 150 by 2030.

The existing runway to taxiway separation of 200 feet meets standards for "exclusively small" aircraft. The separation distance increases to a minimum of 225 feet for B-I aircraft without the "exclusively small" aircraft qualifier and to 240 feet for B-II aircraft, which are considered the critical design aircraft at RCA. The separation standard increases to 300 feet for B-III, C-I, and C-II aircraft and to 400 feet for B-IV and C-III aircraft.

Although a runway to taxiway separation of 240 feet meets the design standard for B-II aircraft, this configuration would not allow adequate space for apron and hangar development to accommodate current and future growth. The 400 foot separation allows aircraft to park and hangars to be constructed closer to the parallel taxiway, while still meeting FAA design standards. It also accommodates all small GA aircraft, including B-III, C-I, and C-II.

It is prudent to construct infrastructure at this time based on cost. Expanding a projected cost of inflation of 3% from 2007 to 2030 reflects a cost increase of nearly 100% over 2007 costs. The incremental cost of locating the runway at 400 foot separation versus 240 foot separation at this time is approximately $450,000, and accounts for minimum required land acquisition, as well as additional taxiway construction costs (Taxiway "A1" and "A4"). In the future, the estimated cost of relocating the runway would be approximately $10 million. Additionally, the increased separation will reduce the potential conflict between aircraft on the parallel taxiway and those either landing or departing on the runway. This will minimize the chances of "proximity accidents."

The FAA's common practice is to plan for potential and future operations as long as the cost of accommodating such operations is substantially less than doing the work in the future. This project provides a runway length to meet 100% of small aircraft, meets the minimum standard for B-II aircraft, accommodates the occasional aircraft which is faster

or has a greater wingspan than B-II aircraft, and provides the required space for development of airfield facilities.

In order to construct a 5,200 foot runway and construct taxiways and hangar development areas at RCA, this project will also require a minimum acquisition of approximately 132.0 acres of land. An additional 96.0 acres of land would be needed through easement for compatible land use regarding noise.

In summary, the purpose of this project is to assure that RCA complies with minimum FAA design standards for runway to taxiway separation and runway length for small aircraft forecast to use the airport during the next twenty years. This project will require construction of a new runway 16-34; expansion of aprons, taxiways; acquisition of 138.1 acres of land; and development of hangar areas to accommodate current and future growth. Alternative 4 satisfies these requirements and has been selected as the preferred alternative for this project.

1.2.2 Need for the Proposed Development:

The safe and efficient use of RCA is currently compromised by design deficiencies. The airport was initially designed for use by small aircraft with shorter wingspans than the type of aircraft using the airport today. The runway is located too close to the parallel taxiway and the runway length is too short to accommodate 100% of the fleet of General Aviation (GA) aircraft that currently use the airport.

Runway 16-34 at RCA, with a length of 4,200 feet, is 1,000 feet short of the ultimate recommended length for the critical aircraft that use the airport today and that are forecast to use the airport in the 20-year planning period. The length recommendation is primarily based on elevation, temperature, and for GA facilities, a percentage of the aircraft fleet using the airport. In this case, the small aircraft with less than 10 passenger seats. An ultimate runway with a length of 5,200 feet is recommended to serve 100% of small airplanes.

The need for the proposed improvements at RCA is based on the facility deficiencies, as outlined in the draft 2000 Ravalli County Airport Master Plan Update, the Ravalli County Growth Policy, and the February 2003 Airport Layout Plan Narrative Report and Airport Layout Plan.

The airport, as it presently exists, does not meet essential design standards required to support the existing or the forecast airport activity for small GA aircraft. Tables 1-1 and 1-2 show existing dimensions and the required design standards for runways and taxiways associated with an ARC for B-II aircraft. The tables also show the proposed dimensions for airport development as shown on the Airport Layout Plan (ALP), and highlight the design deficiencies at RCA.

The design standards shown are for a B-II aircraft with a visual approach (no instrumentation) at each end of the runway. The design standards shown are found in Advisory Circular 150/5300-13 through Change 11 (Airport Design), Advisory Circular

150/5340-1J (Standards for Airport Markings), Advisory Circular 150/5325-4 (Runway Length Requirements for Airport Design), and the current edition of the Federal Aviation Regulations Part 77.

TABLE 1-1: Runway – Design Standards & Recommended Improvements

Description	Required	Existing	Ultimate (future)
R/W Length	5200' (1)	4200'	5200' (1)
R/W Safety Area (L/W)	5800' x 150'	4800' x 150'	5800' x 150'
Separation Standards R/W Centerline to: Taxiway Centerline	240'	200'	400' (2)

(1) Recommended length to serve 100% of the General Aviation fleet for small airplanes.

(2) Recommended separation for B-II aircraft and to provide space for apron and hangar growth. This separation also accommodates faster aircraft and aircraft with wingspans greater than B-II, the critical aircraft.

TABLE 1-2: Taxiway – Design Standards

Description	Current		ALP
	Required	Existing	Ultimate (future)
T/W Width	35'	30'	35'
T/W Safety Area Width	79'	79'	79'

In summary this project assures RCA will comply with minimum FAA design standards for runway to taxiway separation, and runway length standards for small aircraft forecast to use the airport during the next twenty years. In order to correct the current design deficiencies at RCA, the airport will need to design the runway, expand the separation between the runway and taxiway, and acquire land. (This project will include expansion of aprons, taxiways, development of hangar areas, and acquisition of 138.1 acres of land to accommodate current and future growth.)

1.2.3 Summary of RCA Aviation Forecasts:

In the late 1990's, while the overall based aircraft in the Northwest United States declined, Ravalli County and the Ravalli County Airport saw an increase in based aircraft. The forecast for future based aircraft are included in Appendix IV, *Forecasts of Aviation Activity*. Two methods were utilized, one based on future growth on the increase in based aircraft experienced at the airport over the last ten years and the other relating aircraft increases due to growth in area population. Historical data for the proceeding 10 years can be found at the end of Appendix IV, *Forecasts of Aviation Activity* .

The total based aircraft was forecast to increase at about 2 ½% per year from 88 based airplanes in 2003 to a projected high of 156 airplanes based at RCA in 2030. While a conservative figure was utilized in projecting future aircraft impacts, analysis of the last few years of data indicate that the growth in based aircraft at the airport has ranged from 5% per year, up to as much as 14% per year. Further, it is important to note that based aircraft counts identify a spike in growth with 126 based aircraft in 2008.

As the airport continues to grow, the need for additional apron and hangar space to accommodate aircraft using the airport also grows. Historical records of the Ravalli County Airport verify a growth rate of 3% per year over the preceding ten years (1993-2003). Averaging the preceding ten year growth rate of 3% and low end growth rate experienced since 2003 of 5% results in a 2007-2030 upper forecast of 4% growth. Applying a 4% per year growth rate to the 119 based airplanes at RCA in 2007 yields an estimated based aircraft count of 287 in 2030.

The runway length recommendation is primarily based on elevation, temperature, and for GA facilities, a percentage of the fleet using aircraft – in this case, the small aircraft with less than 10 passenger seats. An ultimate runway with a length of 5,200 feet is recommended to serve 100% of small airplanes.

With the growth of GA usage and based aircraft comes the need to provide areas for hangar development for storage, apron area to accommodate larger aircraft and provide for temporary storage of aircraft moving between hangar storage and flight operations, and taxiway facilities to move aircraft from ramp and hangar areas to the runway. Appendix IV, *Forecasts of Aviation Activity*, identifies the impacts and required needs of the projected traffic at various stages to the year 2030. While the airport has the necessary area to provide for present hangar development, the area for future hangared or parked (apron) aircraft is very limited and will not meet future projected requirements of RCA. The existing parking apron is too small to meet the current needs of RCA. This problem reaches critical proportions during summers and in particular during fire fighting season when the apron demand is heavy.

1.2.4 Comparison to other General Aviation Airports in Montana:

Montana has approximately 122 public-use GA airports. Of these, approximately 55 have received Federal grant assistance.

RCA is one of the busiest GA facilities in Montana and has more based aircraft than any other GA airport in the state. In 2008 RCA has 126 based aircraft and the Laurel Airport (second largest GA Airport) has 110 (per FAA Form 5010-1 No. based 6/6/08). The remaining GA facilities have fewer based aircraft.

RCA has more based aircraft than two of the seven primary commercial service airports in Montana (based on the 2008 current Airport Master Records, FAA form 5010-1). As an uncontrolled airport (no air traffic control tower), it is essential that layout of taxiways, aprons, and runways, meets FAA design standards.

TABLE 1-3: Based Aircraft – Montana Primary Service Airports

Current 5010 Data (6/2008)		
	Number of Based Aircraft	**Tower (Y/N)**
Billings	173	Y
Bozeman	275	Y
Butte	38	N
Helena	268	Y
Great Falls	106	Y
Missoula	146	Y
Kalispell	159	Y

As shown in Table 1-4, of the 25 GA airports in Montana that are classified as B-II, only two locations do not have a length to accommodate 95% of the fleet at the given elevation and temperature: these are RCA and Broadus. RCA is the only airport that does not meet the runway to taxiway separation criteria for B-II aircraft. Most airports meet runway length standards (40/55) and most of the airports with parallel taxiways meet separation standards (24/25).

TABLE 1-4: General Aviation Airport Comparison

Airport Reference Code	Airports in Design Group I and II	Airports that meet 95% runway length	Airports with parallel taxiways	Airports that meet taxiway separation standards
B-I	30	17	11	11
B-II	25	23	14	13
Total	55	40	25	24